

NOTES ON THE BARRED PATTERN IN THE SHEEPSHEADS,  
*ARCHOSARGUS PROBATOCEPHALUS* AND *A. OVICEPS*

DAVID K. CALDWELL<sup>1</sup>

*United States Fish and Wildlife Service  
and The Florida State Museum*

In his original description of *Archosargus oviceps*, Ginsburg (1952) discusses the variation in color pattern of this form and its near relative, *A. probatocephalus* (Walbaum). The only substantial character he found (with which I concur) to distinguish the two forms is the number of dark bars on the side. Not counting the incomplete head bar, *A. oviceps* has five (Figure 1A), and *A. probatocephalus* has six (Figure 1B).

Ginsburg suggested that the geographic dividing line between the forms lies in the Gulf of Mexico in the vicinity of the Florida-Alabama line (*A. oviceps* to the west and *A. probatocephalus* to the east). The specimens I have examined from Destin, Florida, some 70 miles east of the state line, are primarily 5-barred, and those from Cedar Key, Florida, are mostly 6-barred. Joseph and Yerger (1956: 136), in anticipation of the placing of Ginsburg's *A. oviceps* in synonymy (personal conversation with Yerger in March, 1958), listed *A. probatocephalus* from Alligator Harbor, Franklin County, Florida, although their specimen was of the 5-barred type. Alligator Harbor lies about 175 shoreline miles east of Destin, and about 115 shoreline miles northwest of Cedar Key. Thus the break between the two primary color variants must lie somewhere between Cedar Key and Alligator Harbor.

Analyzing the two forms, Ginsburg found that of 269 specimens of *A. probatocephalus* he examined, 24 had 6 bars on one side and 5 on the other and 14 had 5 bars on both sides. Since he found these non-6-barred patterns only on specimens 74 mm. (presumably standard length) or smaller, and as all specimens he examined which were 92 mm. or larger had 6 bars, he felt that ". . . an obvious and plausible explanation . . ." for the non-6-barred condition in *A. probatocephalus* ". . . is linked with a lethal factor which results in the failure of such variants to reach some size, much less to reach adulthood." He thus postulated a ". . . physiological barrier . . ." as one of the isolating factors between the two forms. Of 78 speci-

<sup>1</sup> Fishery Research Biologist, South Atlantic Fishery Investigations, Brunswick, Georgia.

mens he examined of *A. oviceps*, two (14 and 35 mm.) had the asymmetrical pattern—none had 6 bars on both sides. He also suggested that the physiological barrier was operating here and it must be presumed that a 6-barred individual from the range of *A. oviceps* would also be considered a "variant" and subject to the barrier. Although the possibility of sympatric species, or of allopatric species exhibiting parallelism in all age groups (see below), cannot be discounted, Ginsburg obviously did not subscribe to these possibilities and considered his species a member of an allopatric species-pair, neither of which exhibits parallelism in the adult or sub-adult stages.

Ginsburg also discussed a geological barrier possibly related to past geologic history. However, it is not the aim of this paper to discuss this, nor should it be considered a revision of the group—though a broad nomenclatorial postulation is presented below. Rather, its purpose is to report specimens which would fall into Ginsburg's classification of "variants" and yet which have reached maturity, or at least adult or sub-adult size. Some of the variations reported below are much more bizzare than those discussed by Ginsburg, and still others undoubtedly exist. I agree with him that the particular banded pattern is almost surely constant once established in an individual.

The bar-pattern-variants may conveniently be divided into two groups—those which are known from the range of 6-barred *A. probatocephalus* and those from the range of 5-barred *A. oviceps*.

In the first category the only variants which I have seen are ones with 5 bars on both sides (Figure 1A). In the 5-barred condition the bars are somewhat wider than those found on 6-barred fishes.

The first of these (University of Florida Collections 2269), 272 mm. in standard length, was collected on January 10, 1954, at Cedar Key, Levy County, Florida. The second (UF 2281), 221 mm. in standard length, was taken at Blind Pass, between Sanibel and Captiva islands, Lee County, Florida, on February 3, 1954. This locality is about 240 shoreline miles south of Cedar Key. The specimen was a fully mature, running ripe, male. Dr. Victor G. Springer, of the Florida State Board of Conservation, writes that he has noted three variant specimens from the range of the 6-barred *A. probatocephalus*. All are from or off the Tampa Bay region of the west coast of peninsular Florida about midway between Cedar Keys and Blind Pass. These records are summarized

as follows: (1) February 14, 1958, one, with a 6-5 pattern, 230 mm. in length, from about 8 miles offshore between Indian Rocks Beach and Clearwater. (2) February 24, 1958, one, with a 5-5 pattern, 80 mm. in length, from Cross Bayou Canal, Pinellas County. (3) February 24, 1958, one, with a 5-5 pattern, 81 mm. long, from the southern part of Boca Ciega Bay, Pinellas County. Dr. Springer wrote that all were taken in company with 6-6 barred individuals. Mr. Thomas R. Hellier, Jr. (who was searching for such variants for me), told me that he observed a 5-barred individual, approximately 225 mm. in standard length, in a commercial fish house at Jensen Beach (near Ft. Pierce), Martin County, lower Atlantic coast of Florida. The fish had been taken locally. I photographed another individual with 5 bars in the tanks of Marine Studios, Marineland, Florida, in September, 1954. I was told by the curator, Mr. F. G. Wood, that this fish, estimated to be about 125 mm. in standard length, was caught in the vicinity of St. Augustine, St. Johns County, Florida.

The variants observed from within the range of *A. oviceps* are all from Destin, Okaloosa County, Florida—near the eastern end of the range of this form. All of the fishes noted below were living in the tanks of Florida's Gulfarium at nearby Ft. Walton Beach. Lengths are estimates, but all fish were full adult or sub-adult in size. I have photographs of all of these (from which the accompanying figures were taken), but the officials of the Gulfarium were understandably loath to part with their hard-caught specimens—even for scientific purposes. I first observed all but the one illustrated as Figure 1 F on July 16, 1956. All had been collected from the same spot (under the U. S. Highway 98 bridge over East Pass) and on such closely spaced dates that a single local resident population was presumed to have been sampled. It is therefore of special interest to note that all of the bar patterns illustrated in Figures 1 A to 1 E were taken from precisely the same local population. These captive individuals were still living in July, 1957, when the oddly marked individual illustrated in Figure 1 F, taken from the same locality, was first observed.

Individuals with six bars on both sides (Figure 1 B) were not infrequently encountered at the Gulfarium. I observed 6, all longer than 350 mm. standard length. Hildebrand (1955: 211) also found this variation in specimens he examined at Port Isabel, Texas, about 940 shoreline miles west of Destin. In addition, he noted

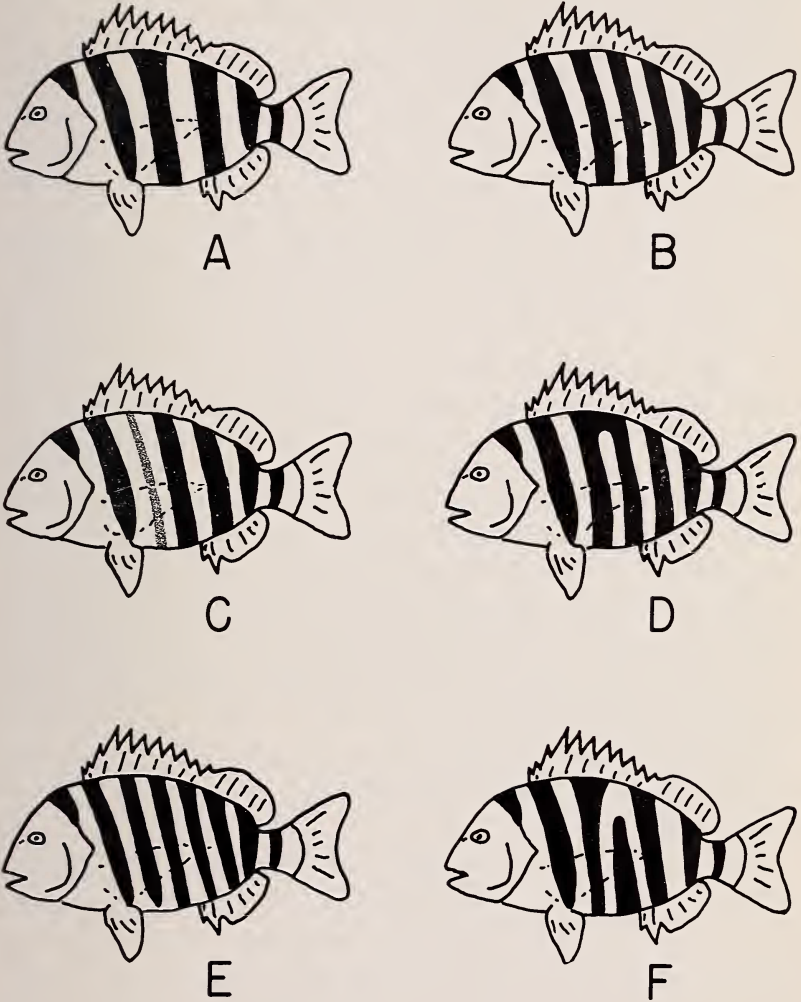


Figure 1. Semi-diagrammatic representation of some variations in bar pattern in the black-barred sheepheads, *Archosargus probatocephalus* (Walbaum) and *A. oviceps* Ginsburg. See text for explanation of figure. (General body outline after Smith, 1907: Plate 14).

them south of Texas—on the Mexican coast. He listed a small locally-caught 6-barred individual in the collection of the Institute of Marine Science of the University of Texas, at Port Aransas, approximately 815 shoreline miles west of Destin. I have seen this specimen and can confirm his bar count. Another *Gulfarium* specimen, approximately 450 mm. in standard length, had 6 normally-sized and placed bars on the left side (Figure 1 B). The pattern on the right side also consisted of 6 bars, but the second full bar was much narrower (half the width of the others) and less intense (Figure 1 C). Another individual, approximately 350 mm. in standard length, had 6 bars on each side, but the second and third full bars on the right side were joined dorsally by an equally intense cross-bar (Figure 1 D). Still another large fish, about 450 mm. in standard length, had 6 bars on its left side and 7 on the right (Figure 1 E). With regard to this variation it is thought-provoking to note that Smith (1907 :301), in describing the color of *A. probatocephalus*, in North Carolina, stated that the body has "6 to 8 broad, black, nearly vertical bands." Even counting the incomplete head band, thus giving a count of 7 for the nominal form *A. probatocephalus*, the "8" would infer that he observed at least one 7-barred specimen, in addition to 5-barred specimens inferred by his count of "6" (counting bars as described earlier in this paper). The last variant observed at the *Gulfarium* is one with 6 bars on the right side, and the pattern illustrated in Figure 1 F on the left. This fish was about 275 mm. in standard length.

Hildebrand (1955: 211) notes that he found a specimen with the asymmetrical (6-5) bar pattern from the Campeche banks off the west coast of Yucatan, Mexico.

In black-barred forms of *Archosargus*, one bar is located near the base of the caudal fin and two others are positioned below the origin and end of the dorsal fin. These 3 and the incomplete bar on the head apparently are stable in position (Figure 1). The bars between those below the origin and end of the dorsal fin are the ones that have been reported to produce the variation (Figure 1).

It becomes evident that the character of color pattern in the black-barred sheepsheads can be unstable, whether genetically or ecologically influenced, and it seems quite likely that thorough analysis of large series of sheepsheads may prove *A. oviceps* synonymous with *A. probatocephalus*, as suggested by Hildebrand (1955:

212); or more likely, since the two nominal forms do exhibit the reasonably constant single character of bar number, of subspecific rank—at least for the sake of nomenclatorial convenience. *A. aries* (Valenciennes)<sup>2</sup>, a South and Central American form apparently distinguished only by having narrower bars (6) than *A. probatocephalus* (Ginsburg, 1952: 96) and teeth, possibly also falls into this pattern complex, as suggested by Eigenmann and Hughes (1888: 69).

In addition to the above-described variations in bar pattern, the following aberrantly-colored specimen of *A. probatocephalus* has been loaned to me by Dr. Springer. At his request, this specimen will be deposited in the fish collection of the United States National Museum.

The fish is 218 mm. in standard length and to all intents might be superficially called an albino. However, since there is some melanophoric pattern still evident in the preserved fish, and since Dr. Springer wrote that as a fresh specimen "there was much color present as carotenoids," this individual might be more properly termed a golden variant. Hubbs and Springer (1957: 308) have reported such a color variation in *Gambusia hurtadoi* Hubbs and Springer from fresh water in Mexico. Dr. Springer has kindly allowed me to include here his color notes taken from the sheep's-head when fresh. It was collected by T. Schaum on November 15, 1957, in Tampa Bay, Florida (more precisely, south of Bunce's Bridge—second bridge south of St. Petersburg on the Sunshine Causeway, U. S. highway 19). Dr. Springer wrote: "Life coloration. Overall body color bright golden yellow with scale margins pinkish. Spines of dorsal pinkish, posterior dorsal yellow with base pinkish. Caudal: dusky on center rays, upper and lower rays pinkish orange; posterior margin light yellow. Anal spines pinkish as is anal base; rays yellow. Pelvic: pink-yellow; pectoral same as pelvic, but with a black blotch at bases of upper rays and in axil. A poorly defined humeral spot on one side. Lips pink; forehead pink and gold; breast light yellow, belly pink; iris golden." The pectoral blotch and the humeral spot are present in normally pigmented black-barred sheep'sheads, but are obscured by the black bars. This golden specimen has very light traces of 6 complete bars, in addition to a faint head bar. In addition to this specimen, Dr. Springer stated that he had had reports of two additional "golden"

<sup>2</sup> In using the single author name I follow Bailey (1951: 249).

color-variants, but that he had been unable to see them and so listed them only tentatively.

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